WHAT IS CLAIMED IS:

1. A perpendicular magnetic recording system comprising a perpendicular magnetic recording medium having a soft magnetic underlayer and a magnetic recording head for performing magnetic recording on said perpendicular magnetic recording medium, said magnetic recording head having a plurality of poles including a main pole for finally recording a magnetization reversal on said perpendicular magnetic recording medium, the perpendicular magnetic recording system satisfying

$$T_{b1} < (B_{S1} \times T_m \times T_{WW}) / 2(B_{S2} \times (T_m + T_{WW})),$$

where T_{b1} is the thickness of said soft magnetic underlayer in said perpendicular magnetic recording medium, B_{S2} is the saturation flux density of the same, T_m is the thickness of said main pole along a track direction in the vicinity of its floating surface, T_{WW} is the track width of the same, and B_{S1} is the saturation flux density of the same.

2. The perpendicular magnetic recording system according to claim 1, wherein the thickness T_{b1} of said soft magnetic underlayer satisfies

$$T_{b1} > 0.25(B_{S1} \times T_m \times T_{WW}) / 2(B_{S2} \times (T_m + T_{WW})).$$

3. The perpendicular magnetic recording system according to claim 1, wherein $T_{WW} < 0.5$ μm.

4. The perpendicular magnetic recording system according to claim 2, wherein $T_{WW} < 0.5$ μm.

5. The perpendicular magnetic recording system according to claim 1, wherein the distance between said main pole and another pole of said magnetic recording head is greater than or equal to

0.5 μm.

6. The perpendicular magnetic recording system according to claim 2, wherein the distance between said main pole and another pole of said magnetic recording head is greater than or equal to 0.5 μm.

7. The perpendicular magnetic recording system according to claim 3, wherein the distance between said main pole and another pole of said magnetic recording head is greater than or equal to 0.5 μm.

8. The perpendicular magnetic recording system according to claim 5, wherein the thickness T_{b1} of said soft magnetic underlayer in said perpendicular magnetic recording medium is smaller than or equal to 0.2 μm.

9. The perpendicular magnetic recording system according to claim 6, wherein the thickness T_{b1} of said soft magnetic underlayer in said perpendicular magnetic recording medium is smaller than or equal to 0.2 μm.

10. The perpendicular magnetic recording system according to claim 7, wherein the thickness T_{b1} of said soft magnetic underlayer in said perpendicular magnetic recording medium is smaller than or equal to 0.2 μm.